

What is claimed is:

1. A transverse longitudinal-cylinder sewing machine,
comprising:

an automatic thread loosening device;

5 a tension adjustment mechanism;

an automatic thread cutting bi-directional solenoid
device; and

a differential fabric driving teeth displacement control
device which includes;

10 a primary transmission mechanism;

a first and a second push mechanisms driven by said
primary transmission mechanism for swinging reciprocally;

a first and a second adjustment mechanism connecting
to said first and said second push mechanisms;

15 a rocking mechanism driven by said primary
transmission mechanism; and

a first and a second fabric driving mechanism driven
by said second push mechanism to move reciprocally and
horizontally, and driven by said rocking mechanism for
20 swinging up and down thereby to move in an oscillated
manner along an ellipsoidal track;

wherein said first and said second fabric driving
mechanisms are normal to other mechanisms and form
chained movements therewith to control an operation
25 displacement between said first and said second fabric driving

mechanisms, thereby to facilitate fabric movement and adjust to deviations of said first and said second push mechanisms through said first and said second adjustment mechanisms to control the relative operating displacements there between.

- 5 2. The transverse longitudinal-cylinder sewing machine of claim 1, wherein said primary transmission mechanism includes a co-axle which is assembled in this order: a first crank, a second crank and a third crank, said seventh crank being coupled with an first axle sleeve of a first bearing, said
10 the first axle sleeve being fastened to one end of said co-axle, said third crank being coupled on one end of an second axle sleeve of a second bearing, then coupled to one side of said seventh crank spaced by a washer, said second axle sleeve having another end coupling with a third bearing which is
15 coupled with said second crank from outside, said second crank having another side corresponding to said second axle sleeve to couple with an anchor assembly to allow said co-axle to couple with a lower arched wire mechanism; said co-axle having another end corresponding to said seventh
20 crank fastened to an third axle sleeve which is coupled with a fourth bearing and a washer ring, said third axle sleeve being coupled with a fourth crank, the co-axle being coupled with a linkage arm, a bearing and a cam of the second push mechanism, the fourth crank having a slot formed at one end
25 to couple with a fifth shaft to pivotally engage with said two

linking arms to connect said first push mechanism and said first adjustment mechanism.

3. The transverse longitudinal-cylinder sewing machine of claim 1, wherein said the first push mechanism includes a fifth
5 crank which is pivotally coupled with another end of said linking arm, said fifth crank being coupled with a second shaft through an fourth axle sleeve, said second shaft having another end coupling with a sixth crank which has another end to pivotally couple with a first push arm through an anchor
10 member and connect to said first fabric driving mechanism.

4. The transverse longitudinal-cylinder sewing machine of claim 1, wherein said first adjustment mechanism has a driven member which has apertures formed thereon, one aperture being engaged with a fastener for fastening, another aperture
15 being coupled with a driving shaft of a rocker adjustment assembly, and yet another aperture being pivotally coupled with said linking arm through a seventh shaft.

5. The transverse longitudinal-cylinder sewing machine of claim 1, wherein said second crank of said primary
20 transmission mechanism has another end connecting to said second push mechanism, the another end of said second crank being pivotally coupled with one end of a seventh crank through a third shaft, the end of said seventh crank inside the sewing machine, said seventh crank being driven by an axle,
25 said axle located on one side of said seventh crank being

coupled through an fifth axle sleeve, a self-lubricating bearing, and a linking element, the linking element being pivotally coupled with a linkage arm on a lower side thereof; said axle located on another side of said seventh crank being coupled
5 with another self-lubricating bearing and a linking element sandwiched between sixth and seventh axle sleeves, said linking element being connected to said second adjustment mechanism.

6. The transverse longitudinal-cylinder sewing machine of
10 claim 1, wherein said second adjustment mechanism is pivotally coupled with said linking element through one end of an eighth crank having another end pivotally coupled with a linking arm and a ninth crank through a fourth shaft, said ninth crank having one end connecting to a driven member
15 through a fifth shaft, said driven member having apertures formed thereon, one aperture being coupled with said fifth shaft, another aperture being coupled with an anchor member for anchoring, and a final aperture being coupled with a driving shaft of a rocker adjustment assembly, said linking
20 arm of said second adjustment mechanism having another end driving said second fabric driving mechanism through tenth and eleventh cranks.

7. The transverse longitudinal-cylinder sewing machine of claim 1, wherein said first and said second fabric driving
25 mechanisms include first and second sliding arms which have

sliding troughs at the bottom to couple with a bracing shaft which serves as a fulcrum to said first and said second sliding arms, said first and said second sliding arms having distal ends which have rear fabric driving teeth and front fabric driving teeth respectively.

8. The transverse longitudinal-cylinder sewing machine of claim 7, wherein said first and said second sliding arms have respectively another distal end opposite to the front and the rear fabric driving teeth to couple with said rocking mechanism through a sixth shaft; said rocking mechanism having one end fastening to a rocker arm mounted on said sixth shaft, said rocker arm having another end coupled with said seventh crank of said primary transmission mechanism through a coupling member.

9. The transverse longitudinal-cylinder sewing machine of claim 1, wherein said first fabric driving mechanism has a distal end coupled with a first push arm of said first push mechanism through a coupling member, and said second fabric driving mechanism has a distal end coupled with said second push mechanism and said second adjustment mechanism through a second push arm.

10. The transverse longitudinal-cylinder sewing machine of claim 1, wherein said primary transmission mechanism, said first and said second push mechanisms, said first and said second fabric driving mechanisms and said first and said

second adjustment mechanisms have oil passages and oil ports that communicate with each other after assembly.